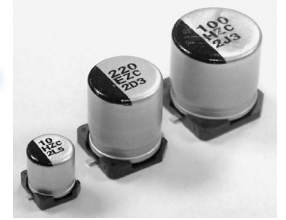


- CYLINDRICAL V-CHIP CONSTRUCTION FOR SURFACE MOUNTING
- HIGH TEMPERATURE RANGE (+125°C)
- LONG LIFE (4,000 HOURS)
- LOW ESR, HIGH RIPPLE CURRENT & LOW LEAKAGE
- 5x6.1 ~ 10x10.5mm CASE SIZES
- REFLOW SOLDERING RATED TO +260°C (ALL SIZES)
- **MEETS THE REQUIREMENTS OF AEC-Q200\***

\*Contact NIC for supporting test data

**High Temperature, Long Life  
& Available with Wide  
Anti-Vibration Terminations**



### CHARACTERISTICS

|                                                |                                                                   |                                        |          |        |         |
|------------------------------------------------|-------------------------------------------------------------------|----------------------------------------|----------|--------|---------|
| Rated Voltage Range                            | 25 ~ 63Vdc                                                        |                                        |          |        |         |
| Rated Capacitance Range                        | 10 ~ 330μF                                                        |                                        |          |        |         |
| Operating Temp. Range                          | -55 ~ +125°C                                                      |                                        |          |        |         |
| Capacitance Tolerance                          | ±20% (M)                                                          |                                        |          |        |         |
| Max. Leakage Current<br>After 2 Minutes @ 20°C | Less than 0.01CV or 3μA<br>whichever is greater                   |                                        |          |        |         |
| Working and Surge Voltage Ratings              | W.V. (Vdc)                                                        | 25                                     | 35       | 50     | 63      |
|                                                | S.V. (Vdc)                                                        | 32                                     | 44       | 63     | 79      |
| Tan δ @ 120Hz/20°C                             |                                                                   | 0.14                                   | 0.12     | 0.10   | 0.08    |
| Load Life Test @ +125°C<br>and Rated Voltage   | Test Duration                                                     | All Case Sizes: 4,000 Hours            |          |        |         |
|                                                | Capacitance Change                                                | Within ±30% of initial measured value  |          |        |         |
|                                                | Tan δ                                                             | Less than 200% of specified max. value |          |        |         |
|                                                | ESR                                                               | Less than 200% of specified max. value |          |        |         |
|                                                | Leakage Current                                                   | Less than specified max. value         |          |        |         |
|                                                | Low Temperature ESR after<br>endurance test<br>ESR @ 100KHz/-40°C | φ5x6.1                                 | φ6.3x6.1 | φ6.3x8 | φ8x10.5 |
|                                                |                                                                   | 2.0Ω                                   | 1.4Ω     | 0.8Ω   | 0.4Ω    |

### STANDARD PRODUCTS AND CASE SIZES Dφ x L (mm)

| PART NUMBER               | Case Size<br>(D X L)<br>mm | Cap.<br>(μF) | Working<br>Voltage | Max. Tan δ<br>120Hz/20°C | Max. ESR (mΩ)<br>@ 100KHz/20°C | Max. Ripple Current<br>(mA rms) @ 100KHz/125°C | Load Life<br>Hours<br>(+125°C) |
|---------------------------|----------------------------|--------------|--------------------|--------------------------|--------------------------------|------------------------------------------------|--------------------------------|
| NSPE-Z330M25V5X6.1NLBYF   | 5X6.1                      | 33           | 25                 | 0.14                     | 80                             | 550                                            | 4,000                          |
| NSPE-Z560M25V6.3X6.1NLBYF | 6.3X6.1                    | 56           |                    | 0.14                     | 50                             | 900                                            | 4,000                          |
| NSPE-Z101M25V6.3X8NLBYF   | 6.3x8                      | 100          |                    | 0.14                     | 30                             | 1400                                           | 4,000                          |
| NSPE-Z221M25V8X10.5NLBYF  | 8x10.5                     | 220          |                    | 0.14                     | 27                             | 1600                                           | 4,000                          |
| NSPE-Z331M25V10X10.5NLBYF | 10x10.5                    | 330          |                    | 0.14                     | 20                             | 2000                                           | 4,000                          |
| NSPE-Z220M35V5X6.1NLBYF   | 5X6.1                      | 22           | 35                 | 0.12                     | 100                            | 550                                            | 4,000                          |
| NSPE-Z470M35V6.3X6.1NLBYF | 6.3X6.1                    | 47           |                    | 0.12                     | 60                             | 900                                            | 4,000                          |
| NSPE-Z680M35V6.3X8NLBYF   | 6.3x8                      | 68           |                    | 0.12                     | 35                             | 1400                                           | 4,000                          |
| NSPE-Z151M35V8X10.5NLBYF  | 8x10.5                     | 150          |                    | 0.12                     | 27                             | 1600                                           | 4,000                          |
| NSPE-Z271M35V10X10.5NLBYF | 10x10.5                    | 270          |                    | 0.12                     | 20                             | 2000                                           | 4,000                          |
| NSPE-Z100M50V5X6.1NLBYF   | 5X6.1                      | 10           | 50                 | 0.10                     | 120                            | 500                                            | 4,000                          |
| NSPE-Z220M50V6.3X6.1NLBYF | 6.3X6.1                    | 22           |                    | 0.10                     | 80                             | 750                                            | 4,000                          |
| NSPE-Z330M50V6.3X8NLBYF   | 6.3X8                      | 33           |                    | 0.10                     | 40                             | 1100                                           | 4,000                          |
| NSPE-Z680M50V8X10.5NLBYF  | 8X10.5                     | 68           |                    | 0.10                     | 30                             | 1250                                           | 4,000                          |
| NSPE-Z101M50V10X10.5NLBYF | 10X10.5                    | 100          |                    | 0.10                     | 28                             | 1600                                           | 4,000                          |
| NSPE-Z100M63V6.3X6.1NLBYF | 6.3X6.1                    | 10           | 63                 | 0.08                     | 120                            | 700                                            | 4,000                          |
| NSPE-Z220M63V6.3X8NLBYF   | 6.3X8                      | 22           |                    | 0.08                     | 80                             | 900                                            | 4,000                          |
| NSPE-Z330M63V8X10.5NLBYF  | 8X10.5                     | 33           |                    | 0.08                     | 40                             | 1100                                           | 4,000                          |
| NSPE-Z560M63V10X10.5NLBYF | 10X10.5                    | 56           |                    | 0.08                     | 30                             | 1400                                           | 4,000                          |

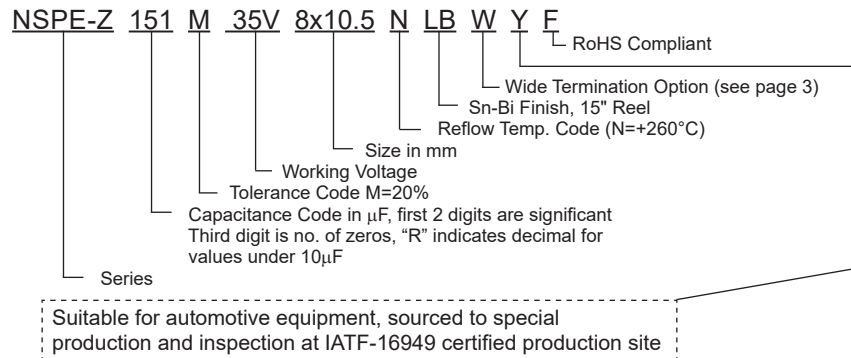
For Automotive Applications See Part Numbering System

### RIPPLE CURRENT FREQUENCY CORRECTION FACTOR

| Frequency         | 120Hz | 1KHz | 10KHz | ≥100KHz |
|-------------------|-------|------|-------|---------|
| Correction Factor | 0.10  | 0.30 | 0.60  | 1.00    |

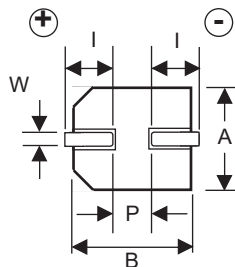
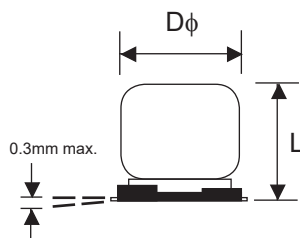


### PART NUMBER SYSTEM

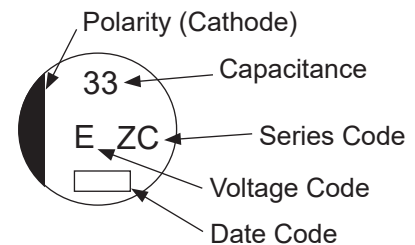


### DIMENSIONS (mm)

| Case Size | $D\phi \pm 0.5$ | L max. | A, B $\pm 0.2$ | W           | $I \pm 0.3$ | $P \pm 0.2$ |
|-----------|-----------------|--------|----------------|-------------|-------------|-------------|
| 5x6.1     | 5               | 6.1    | 5.3            | 0.55 ~ 0.75 | 2.2         | 1.5         |
| 6.3x6.1   | 6.3             | 6.1    | 6.6            | 0.55 ~ 0.75 | 2.6         | 1.8         |
| 6.3x8     | 6.3             | 8.0    | 6.6            | 0.55 ~ 0.75 | 2.6         | 1.8         |
| 8x10.5    | 8.0             | 10.5   | 8.3            | 0.7 ~ 1.1   | 3.4         | 3.1         |
| 10x10.5   | 10              | 10.5   | 10.3           | 0.7 ~ 1.1   | 3.5         | 4.6         |



### Part Marking

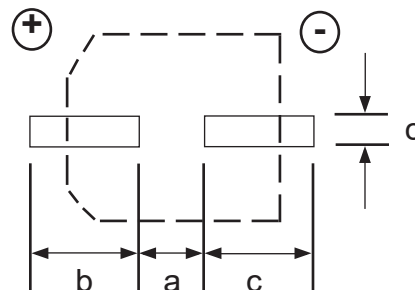


### VOLTAGE RATING CODES

| Code | Voltage Rating |
|------|----------------|
| E    | 25V            |
| V    | 35V            |
| H    | 50V            |
| J    | 63V            |

### LAND PATTERN DIM. (mm)

| Case Dia. | a   | b   | c   |
|-----------|-----|-----|-----|
| 5         | 1.5 | 2.8 | 1.6 |
| 6.3       | 1.8 | 3.2 | 1.6 |
| 8         | 3.1 | 4.0 | 2.0 |
| 10        | 4.6 | 4.1 | 2.0 |



### PRECAUTIONS

Please review the notes on correct use, safety and precautions found at <https://www.niccomp.com/resource/files/aluminum/AlumApplInfoCautions.pdf>  
If in doubt or uncertainty, please review your specific application - process details with  
NIC's technical support personnel: [tpmg@niccomp.com](mailto:tpmg@niccomp.com)



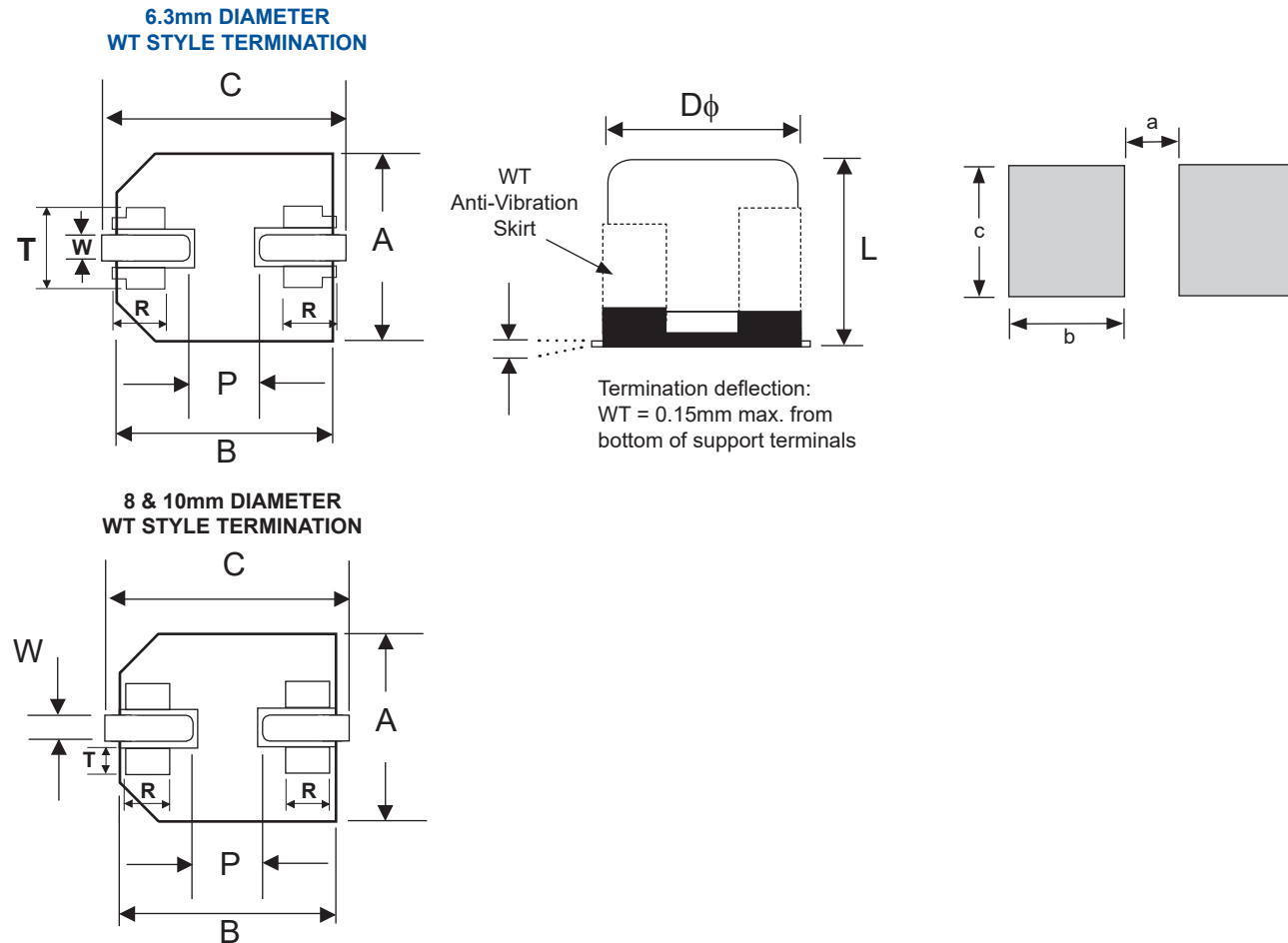
### WIDE TERMINATION DIM. (mm)

| Case Size   | D $\phi$ $\pm 0.5$ | L max. | A, B           | C max. | P     | W              | R                | T             |
|-------------|--------------------|--------|----------------|--------|-------|----------------|------------------|---------------|
| 6.3x6.1     | 6.3                | 6.4    | 6.6 $\pm 0.2$  | 7.8    | (2.2) | 0.65 $\pm 0.1$ | (1.3 $\pm 0.2$ ) | 3.0 $\pm 0.2$ |
| 6.3x8       | 6.3                | 8.3    | 6.6 $\pm 0.2$  | 7.8    | (2.2) | 0.65 $\pm 0.1$ | (1.3 $\pm 0.2$ ) | 3.0 $\pm 0.2$ |
| 8 x 10.5WT  | 8.0                | 10.8   | 8.3 $\pm 0.2$  | 10.0   | (3.1) | 1.2 $\pm 0.2$  | 0.7 $\pm 0.2$    | 1.3 $\pm 0.2$ |
| 10 x 10.5WT | 10.0               | 10.8   | 10.3 $\pm 0.2$ | 12.0   | (4.6) | 1.2 $\pm 0.2$  | 0.7 $\pm 0.2$    | 1.3 $\pm 0.2$ |

(Reference dimensions)

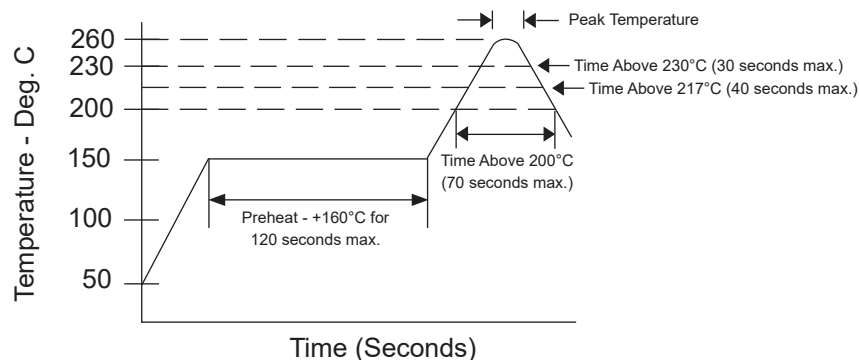
### WIDE TERMINATION LAND PATTERN DIM. (mm)

| Case Size | a   | b   | c   |
|-----------|-----|-----|-----|
| 6.3x6.1   | 1.2 | 3.6 | 3.2 |
| 6.3x8     | 1.2 | 3.6 | 3.2 |
| 8x10.5    | 2.7 | 4.0 | 4.7 |
| 10x10.5   | 3.9 | 4.4 | 4.7 |



| W (Wide Terminations) Anti-Vibration Test |                                                                                                                                                                                               |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Method                               | Direction: X, Y, Z axis<br>Frequency & Duration: 5 to 2000Hz reciprocation for 20 minutes, 2 hours each direction<br>Peak to Peak Amplitude: 5mm<br>Peak Acceleration: 30G<br>Sweep Type: Log |
| $\Delta$ Capacitance                      | Within $\pm 10\%$ of initial value                                                                                                                                                            |
| Tangent of Loss                           | $\leq$ Specified value                                                                                                                                                                        |
| Leakage Current                           | $\leq$ Specified value                                                                                                                                                                        |

### RECOMMENDED REFLOW SOLDERING PROFILE\*



### PEAK TEMPERATURE AND DURATION

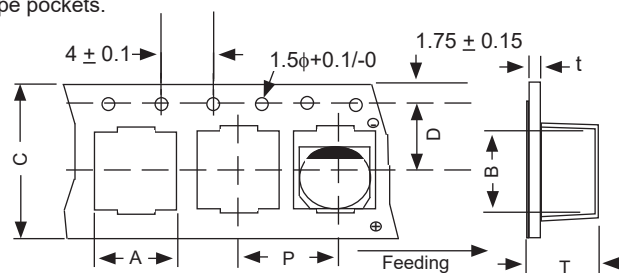
| Diameter   | Peak Temperature | Time            | Time above 230°C | Time above 217°C | # of Reflow Passes |
|------------|------------------|-----------------|------------------|------------------|--------------------|
| φ5 ~ 6.3mm | +260°C           | ≥+250°C 5 sec.  | 30 sec. max.     | 40 sec. max.     | 2                  |
|            | +255°C           | ≥+250°C 10 sec. |                  |                  | 2                  |
| φ8 ~ 10mm  | +260°C           | ≥+250°C 5 sec.  |                  |                  | 1                  |
|            | +245°C           | ≥+240°C 10 sec. |                  |                  | 2                  |

\*Two reflow passes are permissible with a cool down to room temperature required between the first and second pass. Acceptable soldering methods are IR or IR & heated air.

### TAPING SPECIFICATIONS (mm)

- Both Leader and Trailer tape: Minimum 40mm (1.57") empty carrier tape pockets.
- Leader tape: Approximately 20cm of cover tape at leader.
- Connection: Maximum 3 connections (slices) per reel.

| Case Size | A    | B    | C    | D    | P    | T    | t    |
|-----------|------|------|------|------|------|------|------|
|           | ±0.5 | ±0.5 | ±0.3 | ±0.1 | ±0.1 | ±0.2 | max. |
| 5x6.1     | 5.7  | 5.7  | 12.0 | 5.5  | 12.0 | 6.4  | 0.4  |
| 6.3x6.1   | 7.0  | 7.0  | 16.0 | 7.5  | 12.0 | 6.4  | 0.4  |
| 6.3x8     | 7.0  | 7.0  | 16.0 | 7.5  | 12.0 | 8.5  | 0.4  |
| 8x10.5    | 8.7  | 8.7  | 24.0 | 11.5 | 16.0 | 11.0 | 0.4  |
| 10x10.5   | 10.7 | 10.7 | 24.0 | 11.5 | 16.0 | 11.0 | 0.4  |



### REEL DIMENSIONS (mm)

| Case Size | W    | Qty per Reel |
|-----------|------|--------------|
|           | ±1.0 | 15" (380mm)  |
| 5x6.1     | 14   | 1,000        |
| 6.3x6.1   | 18   | 1,000        |
| 6.3x8     | 18   | 900          |
| 8x10.5    | 26   | 500          |
| 10x10.5   | 26   | 500          |

